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ABSTRACT

A study was designed to assess French second language proficiency, native language skills, and academic achievement of students in an intensive French program in an English language school in Montreal. Subjects consisted of three groups of grade 4 and three groups of grade 5 students, each grade level having one group from the intensive French program and two control groups: one from an early immersion program and one from the regular French second language program. French proficiency was assessed with listening comprehension, reading comprehension, and oral production tests, and in grade 4 by an additional written production test. Native language skills and academic achievement were measured in both grades with the Canadian Tests of Basic Skills (English and mathematics). Results show that in both grades, the intensive French group scored lower than the immersion and higher than the regular French group on French tests, except for oral production, and there were no significant differences among the three groups on the English and mathematics tests except on several subtests. It is concluded that the intensive program promotes increased French proficiency without detrimental effects on the development of native language skills and academic achievement. Lower intensive group scores on the French tests are attributed to additional French exposure in the immersion program's early grades. (MSE)

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AN EVALUATION OF THE INTENSIVE FRENCH PROGRAM: GRADES 4 AND 5

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Instructional Services Department

The Protestant School Board of Greater Montreal

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Résumé

Le but de cette étude était d'évaluer les habilités langagières en français et en anglais et le rendement académique des élèves du programme intensif de français langue seconde. Trois groupes d'élèves en 4e année et trois groupes d'élèves en 5e année ont participé à ce projet. A chaque niveau il y avait un groupe du programme intensif (groupe INT) et deux groupes témoins: un groupe d'élèves du programme d'immersion primaire (groupe IMM) et un groupe d'élèves du programme régulier de français langue seconde (groupe REG).

Les habilités langagières en français ont été évaluées à l'aide des tests suivants: un test de compréhension auditive, un test de lecture et un test d'expression orale. En 5e année on a aussi administré un test d'expression écrite. Les habilités langagières en langue maternelle et le rendement en mathématiques ont été évaluées à l'aide d'une série de tests de rendement en anglais (Canadian Tests of Basic Skills).

Les résultats de la 4e année indiquent que: (1) le groupe INT a obtenu des résultats nettement supérieurs à ceux du groupe REG et nettement inférieurs à ceux du groupe IMM aux tests de français, à l'exception de quelques mesures d'évaluation du test d'expression orale. A ces mesures, il n'y avait pas de différences significatives entre le groupe INT et les deux autres groupes. (2) Il n'y avait pas de différences significatives entre les trois groupes aux tests d'anglais et de mathématiques à l'exception du sous-test d'orthographe où le résultat du groupe IMM était

nettement inférieur à celui obtenu par le groupe REG.

Les résultats de la 5e année indiquent que: (1) le groupe INT a obtenu des résultats nettement supérieurs à ceux du groupe REG et nettement inférieurs à ceux du groupe IMM aux tests de français à l'exception de quelques mesures d'évaluation du test d'expression orale. A ces mesures, il n'y avait pas de différences significatives entre le groupe INT et les deux autres groupes. Il n'y avait pas de différences significatives entre les trois groupes aux tests d'anglais et de mathématiques, à l'exception des cas suivants: (i) au sous-test de capitalisation, il n'y avait qu'une différence minime entre les trois groupes; (ii) au sous-test de ponctuation, le groupe IMM a obtenu un résultat nettement supérieur à celui des autres groupes; (iii) au sous-test d'usage, le groupe IMM a obtenu un résultat nettement supérieur à celui du groupe REG.

Les résultats de cette étude nous mènent à conclure que le programme intensif de français langue seconde favorise visiblement le développement des habilités langagières en français sans nuire au développement de la langue maternelle ni au rendement académique. D'autre part, les résultats nettement inférieurs du groupe INT, par rapport au groupe IMM, à la plupart des tests de français, s'explique par le plus grand nombre d'heures de français allouées aux étudiants du programme d'immersion pendant le premier cycle du primaire.

Summary

The purpose of this study was to assess French second language proficiency, mother tongue skills and academic achievement of students enrolled in the Intensive French program. Three groups of grade 4 students and three groups of grade 5 students participated in this study. At each grade level, there was one group of students from the Intensive French program (INT group) and two control groups: a group of students from the early Immersion program IMM group and a group of students from the regular French second language program (REG group).

Proficiency in French was assessed with the following test battery: a listening comprehension test, a reading comprehension test and an oral production test. In grade 5, a written production test was also administered. To assess mother tongue skills and academic achievement, the Canadian Tests of Basic Skills (English and mathematics) were administered at both grade levels.

The results of the grade 4 study indicate that (1) the INT group scored significantly higher than the REG group and significantly lower than the IMM group on the French language tests except for several measures of evaluation of the oral production test. On these measures, there were no significant differences between the INT group and the other two groups. (2) There were no significant differences among the three groups on the English language and mathematics tests except on the spelling subtest where the IMM group scored significantly lower than the REG group.

The results of the grade 5 study show that:(1) the INT group scored significantly higher than the REG group and significantly lower than the IMM group on the French language tests except for several measures of evaluation of the oral production test. On these measures, there were no significant differences between the INT group and the other two groups. (2) On the English language and mathematics tests, there were no significant differences among the three groups except in the following cases (i) on the capitalization subtest, there was a minimally significant difference among the groups; (ii) on the punctuation subtest, the IMM group scored significantly higher than the other two groups; (iii) on the usage subtest, the IMM group scored significantly higher than the REG group.

The findings of this study lead to the conclusion that the Intensive French program promotes increased proficiency in French without detrimental effects on the development of mother tongue skills and academic achievement. The finding that the INT group scored significantly lower than the IMM group on practically all the French language tests is attributed to the greater amount of French instruction which the immersion students have received in the lower elementary grades.

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The purpose of this report is to provide an evaluation of the Intensive French second language program which has been implemented, on an experimental basis, in one of the English language schools of the Protestant School Board of Greater Montreal. The program is the first attempt made by the P.S.B.G.M. to provide an extended core program at the elementary level.

The characteristics of the program are as follows: the program is introduced in grade 4 and at that grade level the instructional time devoted to French is tripled by comparison to the regular French second language program. During the following years, i.e., in grades 5 and 6, the program is less intensive, but still more extensive than the regular French second language program. The time distribution over the three year period is shown below:

Grade 4	90 minutes
Grade 5	60 minutes
Grade 6	60 minutes

The primary objective of the program is the development of communicative skills. To achieve this goal both a more formal second language teaching approach and an informal "immersion" approach are used. The basic text is Bonjour Canada. However, less than half of the daily instructional time is devoted to this text. The rest of the time is evenly divided between an intensive reading program and the development of special themes and activities. The reading program included intensive,

extensive and independent reading and is based on the use of a wide selection of supplementary readers. The purpose of the themes and activities is to provide more informal exposure to oral language in situations that deal with the students' every day life. Writing skills are introduced in grade 4 and are developed more extensively in grades 5 and 6.

The program was initiated in September 1981 at the grade 4 level. The first evaluation of student performance was carried out at the end of that academic year, i.e., in May 1982 (Adiv & Doré, Note 1). The results of that evaluation reveal that: (1) the students participating in the intensive program performed significantly better on all the French language tests than the control group which consisted of students who were taking the regular French second language program (30 minutes a day); (2) there were no significant differences among the groups on the English tests; (3) on the mathematics test, the students participating in the intensive program scored significantly higher than the control group.

The Study

The purpose of the present study was to provide further evaluation of the effectiveness of the intensive French program. This time the assessment of linguistic proficiency and academic achievement was carried out at two grade levels. First the pilot group was assessed at the end of its second year in the program, i.e., at the end of grade 5. Second, a first follow-up group was assessed at the end of its first year in the program, i.e., at the end of grade 4. It was also decided to include

in this year's evaluation a group of immersion students so as to have a control group with a high level of proficiency in French.

As in the previous evaluation, French writing skills were not assessed in grade 4, because writing skills are not developed extensively at that grade level. These skills were, however, assessed in grade 5.

Method

The Sample

Three groups of grade 4 students and three groups of grade 5 students participated in this study. At each grade level, the groups consisted of: (1) a group of students from the intensive French program (hereafter INT group), (2) a group of students from an early French immersion program (hereafter IMM group); (3) a group of students from a regular French second language program (hereafter REG group).

The INT group at the grade 4 level comprised two full classes (INT 1 and INT 2). The INT group at the grade 5 level comprised three classes (INT 3, INT 4, INT 5). One of these classes was part of a split-level class and was therefore much smaller than the other two. The IMM groups and the REG groups consisted of one class at each grade level. Most of the students in all three schools came from middle socio-economic class homes (for exact sample sizes and participating schools see Table 1).

The Test Battery

Two batteries of tests were administered: (1) a battery of French language tests and (2) a battery of English language and mathematics tests. In addition, all the students were administered a Lorge Thorndike test (verbal battery, level A in grade 4 and level B in grade 5) to control for possible differences in mental capacities between the groups.

(1) The French Test Battery

The following French language tests were administered at each grade level (i) a listening comprehension test, (ii) a reading comprehension test and (iii) an oral production test. In grade 5, a written production test was also administered.

All the grade 4 French language tests were the same tests as those that had been used in the evaluation of the grade 4 pilot group in 1982.

(i) Listening Comprehension Test

The French listening comprehension test was a test prepared by the ministère de l'Education for grade 6 students in the regular French second language program. The test consists of 56 multiple-choice items recorded on tape. The items are grouped into four sections. In sections 1 and 2, the students hear a stimulus word or sentence and the four alternative responses are presented in pictures (section 1) or in written sentences (section 2). In section 3, the students see a written sentence

and the four alternative responses are presented orally. In section 4, the students hear a short dialogue and the responses are again presented in written form. The same test was administered in grade 4 and in grade 5.

(ii) Reading Comprehension Test

A different French reading comprehension test was administered at each grade level. The tests comprise two parts. The first part consists of a number of stimulus sentences (17 sentences in grade 4 and 18 sentences in grade 5) which have to be completed by a word or a phrase. In each case, four alternative responses are given. This part of the grade 4 test was taken from the French reading test prepared by the ministère de l'Education for grade 6 students in the regular French second language program. For grade 5, the test was taken from the reading test used in the International Educational Achievement Study (IEA population II; see Carroll, 1975).

The second part of the test consists of several short stories (seven stories in grade 4 and five stories in grade 5). Each story is followed by several questions with multiple choice answers (15 questions in grade 4 and 16 questions in grade 5). This part of the test was adapted from a multi-level reading test developed by the Ontario Institute for Studies in Education for use in immersion programs. For the grade 4 test, the stories were taken from levels 2 and 3; for the grade 5 test, they were taken from levels 3 and 4 .

(iii) Oral Production Test

This test was developed by the Research Department of the P.S.B.G.M. for the present evaluation. The test consists of several sets of pictures. For some of the pictures,a response is elicited by means of questions. The other pictures depict stories which the children had to narrate. A different version of the test was used at each grade level. In grade 4, the students had to answer eighteen questions and narrate two stories. In grade 5, the students had to answer nine questions and narrate three stories.

To assess the students' proficiency in oral production, three different measures of evaluation were used. First, each student's speech sample was evaluated globally by two francophone raters, working independently, on five different dimensions: comprehension, pronunciation, grammar, vocabulary and communication. The ratings ranged from a maximum of 5, indicating native-like skill, to a minimum of 1, indicating very poor skill. The evaluations of both raters were combined to form an average score for each dimension. Second, a more objective evaluation of the students' oral production was provided by rating each sentence according to semantic and grammatical appropriateness. The following four alternatives were considered: (i) the sentence was semantically and grammatically correct; (ii) the sentence was semantically correct but contained grammatical errors; (iii) the response was semantically unacceptable within the context and (iv) there was no response or the response was predominantly in English.

(iv) Written Production Test

This test contains two parts. Part I is a language test and Part II is a free composition. In the language test, the students had to complete a number of sentences. From each sentence, one or two grammatical items (37 in all) had been omitted. This part of the test was taken from the writing test used in the International Educational Achievement Study (IEA population II). In Part II of the test, the students were given four alternative topics and were asked to write a short composition on one of them.

To assess the students' skills in composition writing, each composition was evaluated globally by two francophone raters, working independently. The compositions were rated on four different dimensions: content, grammar, vocabulary and spelling. The ratings ranged from a maximum of 5, indicating native-like skill, to a minimum of 1 indicating very poor skill. The evaluations of both raters were combined to form an average score for each dimension.

As noted above, this test was administered only in grade 5.

(2) The English Language and Mathematics Test Battery

English language skills and achievement in mathematics were measured with the Canadian Tests of Basic Skills, metric version Form 5 (Nelson, 1982). The test comprises six subtests related to language skills (vocabulary, reading, spelling, capitalization, punctuation, and usage) and three subtests related to mathematics skills (concepts, problem solving and computation). The test battery comprises six different levels

(grades 3 through 8). Level 10 was administered in grade 4 and level 11 was administered in grade 5.

Procedure for Administering the Tests

All the tests, except the French oral production test, were group administered to intact grade 4 and grade 5 classes. The tests of students with French-speaking parents were, however, excluded from the evaluation. The oral production test was administered individually. Each individual test lasted approximately 10 minutes and the entire session was tape-recorded.

The French tests were administered by a native-French speaker and the other tests by a native English speaker. All the tests were administered in late spring.

Results

Grade 4

The students' scores on the Lorge Thorndike test were analyzed first using a one-way analysis of variance procedure. Two separate analyses of variance were carried out. In the first analysis, the independent variable was class membership within the INT group (INT 1 vs INT 2). In the second analysis, the independent variable was program (REG, INT, IMM). The results of the first analysis reveal no significant differences between the two classes of the INT group. The

results of the second analysis show, however, that the REG, INT and IMM groups differed significantly from one another in their performance on the Lorge Thorndike test ($F = 4.49$; $p < .05$; $df = 2.96$). Since this difference could influence the results obtained on the other tests, thus confounding the effect of the different language programs, the latter tests were analyzed by means of a covariance procedure (see Appendix I for a brief explanation). Separate analyses were carried out for each test and subtest. In addition, wherever significant differences between the three groups were noted, a Newman Keuls procedure of multiple comparison was used to determine which groups differed significantly from one another. The results of these analyses are summarized in Table 2 (French test results) and Table 3A (English and mathematics test results). All means shown on these tables represent means adjusted for group differences on the Lorge Thorndike test scores.

Aside from the comparison between the three major groups (INT, IMM, REG), two further comparisons were carried out. The first pertains to the comparison between the two classes within the Intensive French program (INT 1 group and INT 2 group). Since these two groups did not differ significantly from one another on the Lorge Thorndike test, the covariance procedure was not used here and all the means shown in the Tables 4 (French test results) and 5A (English and mathematics test results) are unadjusted means.

The second set of analyses compares the performance of this year's INT group to that of the grade 4 Intensive French group which

had been evaluated at the end of last year (Adiv & Doré, Note 1). This comparison pertains only to the French test results since the battery of English and mathematics tests administered this year (CTBS) was different from the one administered last year (Metropolitan Achievement Tests). Moreover, since one of the raters who had evaluated last year's oral production tests was no longer available, these tests were reevaluated using the same raters as in this year's evaluation. The results of this set of analyses are summarized in Table 6. Here again, the procedure used was a simple analysis of variance procedure and the means shown on the table are means directly computed from the raw scores.

Comparison between the Three Programs

(1) The French Test Battery

(i) Listening Comprehension Test

On the listening comprehension test, all three groups differed significantly from one another. The REG group ($\bar{X}$ = 25.48) scored significantly lower than the INT group ($\bar{X}$ = 34.02) who, in turn, scored significantly lower than the IMM group ($\bar{X}$ = 47.86).

(ii) Reading Comprehension Test

The results of the reading comprehension test show a pattern similar to that of the listening comprehension test. The REG group ($\bar{X}$ = 14.36) scored significantly lower than the INT group ($\bar{X}$ = 17.42) who, in turn, scored significantly lower than the IMM group ($\bar{X}$ = 27.28).

(iii) Oral Production Test

The results of the global evaluation reveal that the REG group was rated significantly lower than the IMM group on all five measures of evaluation (comprehension, pronunciation, grammar, vocabulary and communication). The INT group ranked numerically between the REG group and the IMM group. On three measures (pronunciation, grammar and communication), the performance of the INT group was rated as being significantly better than that of the REG group. Moreover, in comprehension, pronunciation and vocabulary, there were no significant differences between the INT group and the IMM group. The IMM group was, however, rated significantly better than the INT group in grammar (INT, $\bar{X} = 3.13$; IMM, $\bar{X} = 3.82$) and in communication (INT, $\bar{X} = 3.86$; IMM, $\bar{X} = 4.46$).

The item analysis shows that the INT group ($\bar{X} = 17.08$) produced significantly more correct responses than the REG group ($\bar{X} = 9.91$) and significantly fewer correct responses than the IMM group ($\bar{X} = 19.13$). The analysis of the incorrect responses indicates that the groups did not differ markedly from one another with respect to the number of grammatically incorrect responses. There were, however, significant differences among the groups on the semantically incorrect responses and on the insufficient responses (no response or responses predominantly in English). On the semantically incorrect responses, the REG group ($\bar{X} = 1.08$) scored significantly lower than the IMM group ($\bar{X} = 0.24$)

and there was no significant difference between the latter group and the INT group ($\bar{X}$=0.67). With respect to the insufficient responses, all three groups differed significantly from one another. The REG group had the largest number of such responses ($\bar{X}$=9.94) followed by the INT group ($\bar{X}$= 6.33) which was followed, in turn, by the IMM group ($\bar{X}$ =1.66).

Since the task of narrating stories differs from having to answer questions, it was decided to evaluate the oral production pertaining to the narration of stories by means of a separate analysis. Three measures were used in the evaluation: grammar, vocabulary and communication. The results reveal that the three groups differed significantly from one another on all three measures. For the REG group, the ratings ranged from 1.77-2.54; for the INT group, they ranged from 2.64-3.27; for the IMM group, they ranged from 3.35-4.35 (for details see Table 2).

(2) The English and Mathematics Test Battery

The results on the Canadian Tests of Basic Skills (CTBS) reveal no significant differences among the groups on the English language tests, except in the case of the spelling subtest where the IMM group ($\bar{X}$= 22.04) scored significantly lower than the REG group ($\bar{X}$ = 26.16). The difference between the latter group and the INT group ($\bar{X}$ = 24.21) was statistically not significant.

There were also no significant differences between the groups on the mathematics tests. This comparison pertains, however, only to the REG and INT groups since the mathematics tests were not administered to the IMM group.

In order to see how the different groups compared to the Canadian national norms, the students' raw scores on the CTBS were transformed into grade equivalents and into stanine scores (for a brief explanation see Appendix II and Appendix III). The results (Table 3B) show that, in terms of grade equivalents, the REG group's performance ranged from a high of 48 (mathematics computation) to a low of 40 (reading comprehension); the INT group's performance ranged from a high of 53 (mathematics computation) to a low of 44 (mathematics problem solving) and the IMM group's performance (excluding mathematics skills) ranged from a high of 56 (language skills, punctuation) to a low of 46 (language skills, spelling). The stanine scores indicate that the INT group (stanine 5) ranked one step above the REG group (stanine 4) on most of the tests. The IMM group's performance was similar to that of the INT group on most of the language skills tests (stanine 5). On vocabulary and reading comprehension, the IMM group (stanine 6) ranked one step above the INT group. All three groups performed, however, within the "average range" of the national norms for grade 4, except in the case of the REG group's results on the reading comprehension test which were below average (stanine 3).

Comparison of the two Classes in the INT Group

The results of the French tests reveal no significant differences between the INT 1 group and the INT 2 group, except in the rating of the comprehension component in oral production (for details see Table 4).

Similarly, there were no significant differences between the two groups on any of the English language and mathematics tests (see Table 5A for mean scores and Table 5B for grade equivalent and stanine scores).

Comparison of the 1982 and 1983 Grade 4 Groups

As noted above, only the French test results were used in the comparison between the 1982 and 1983 grade 4 groups. The results reveal no significant differences between the groups on the listening comprehension test, on the reading comprehension test and on two measures of the oral production test (comprehension and vocabulary). There were also no significant differences between the two groups on the grammatically and semantically incorrect responses (for details,see Table 6). There were, however, significant differences between the groups on the four other measures of the oral production test. On three of these measures (pronunciation, grammar and communication) the 1983 group (pronunciation, $\overline{X} = 3.85$; grammar, $\overline{X} = 3.13$; communication, $\overline{X} = 3.86$) was rated significantly higher than the 1982 group (pronunciation, $\overline{X} = 3.08$; grammar, $\overline{X} = 2.79$; communication, $\overline{X} = 3.11$). On the other hand, the 1982 group produced significantly fewer insufficient responses ($\overline{X} = 4.04$) than the 1983 group ($\overline{X} = 6.28$).

Grade 5

Here again, the students scores on the Lorge Thorndike test were analyzed first, using a one-way analysis of variance procedure. As for

grade 4, both within-group comparisons (INT3, INT4, INT5) and between-group comparisons (REG, INT and IMM) were made. The results of the first set of comparisons were significant ($F = 11.35$, $p < .001$, $df = 2,48$). In consequence, all the other test results were analyzed by means of a covariance procedure. Separate analyses were carried out for each test and wherever significant differences between the three groups were noted, a Newman Keuls procedure of multiple comparison was used to determine which groups differed significantly from one another. The results of these analyses are summarized in Table 7 (French test results) and in Table 8A (English and mathematics test results). All means shown on these tables represent means adjusted for differences on the Lorge Thorndike test scores.

Aside from the comparison between the three major groups (INT, IMM, REG), a further comparison was carried out between the three grade 5 classes within the Intensive French program (INT3, INT4, INT5), Since the differences among these three groups on the Lorge Thorndike test scores were significant, the analysis of covariance procedure was again used in this part of the evaluation. The results of the above set of analyses are summarized in Table 9 (French test results) and Table 10A (English and mathematics test results). All means shown on these tables are means adjusted for differences on the Lorge Thorndike test scores.

(1) <u>French Test Battery</u>

(i) <u>Listening Comprehension Test</u>

On the listening comprehension test, the REG group ($\bar{X} = 32.76$)

scored significantly lower than the INT group ($\bar{X}$ =41.58) who, in turn, scored significantly lower than the IMM group ($\bar{X}$ =48.05).

(ii) Reading Comprehension Test

On the reading comprehension there were again significant differences among all three groups. The REG group scored lowest ($\bar{X}$= 13.63) followed by the INT group ($\bar{X}$ =17.95) which was followed, in turn, by the IMM group ($\bar{X}$ =30.17).

(iii) Oral Production Test

The results of the global evaluation reveal that the REG group was rated significantly lower than the INT group and the IMM group on four of the five measures of evaluation (comprehension, grammar, vocabulary and communication). The INT group, in turn, was rated significantly lower than the IMM group on grammar and vocabulary. On the other hand, there were no significant differences between the INT group and the IMM group on the ratings for comprehension, pronunciation and communication (for the numerical values of the ratings see Table 7).

The item analysis shows that the INT group ($\bar{X}$ = 9.49) produced significantly more correct responses than the REG group ($\bar{X}$ = 4.69) and significantly fewer correct responses than the IMM group ($\bar{X}$ = 15.37). The analysis of the incorrect responses indicates that the groups did not differ markedly from one another with respect to the number of grammatically and semantically incorrect responses. They did, however, differ significantly in terms of the number of insufficient responses (no response or response predominantly in English). The REG group had the highest number of such responses ($\bar{X}$ = 16.65) followed by the INT

group ($\bar{X}$=10.11) which was followed, in turn, by the IMM group ($\bar{X}$=5.10)

(iv) Written Production Test

On Part I of the written production test (language) the REG group ($\bar{X}$ = 5.44) scored significantly lower than the INT group ($\bar{X}$ = 9.23) which, in turn, scored significantly lower than the IMM group ($\bar{X}$ = 25.00).

The three groups differed also significantly from one another on all the measures of evaluation of the composition (content, grammar, vocabulary and spelling). On each case, the INT group (ratings ranged from 2.05 to 2.31) was rated significantly higher than the REG group (ratings ranged from 1.17 to 1.60) and significantly lower than the IMM group (ratings ranged from 3.19 to 3.32).

(2) The English and Mathematics Test Battery

The results on the Canadian Tests of Basic Skills (CTBS) reveal no significant differences among the three groups on the vocabulary test, the reading test and the spelling subtest of the language skills test. Moreover, on the second subtest of the language skills test (capitalization), the difference among the three groups was only marginally significant. On the other two subtests of the language skills test (punctuation and usage), the between-group differences were more pronounced. On the punctuation subtest, the IMM group ($\bar{X}$ = 20.05) scored significantly higher than the INT group ($\bar{X}$ = 15.23) who, in turn, scored significantly higher than the REG group ($\bar{X}$ = 17.06). On the other subtest (usage), the IMM group ($\bar{X}$ = 21.72) scored again significantly higher than

the REG group ($\bar{X} = 17.94$) . The INT group ($\bar{X} = 18.11$) scored numerically between the two other groups, the difference with either group was, however, statistically not significant.

On the mathematics tests, there were no significant differences between the INT group and the REG group (for details of the numerical values of the test results see Table 8A). As noted above, this test was not administered to the IMM group.

In order to see how the different groups compared to the Canadian National norms, the students' raw scores on the CTBS were transformed, as in the case of the grade 4 CTBS results, into grade equivalents and into stanine scores. The results (Table 8B) show that, in terms of grade equivalents, the REG group's performance ranged from a high of 60 (language skills, punctuation) to a low of 49 (mathematics, problem solving), the INT group's performance ranged from a high of 61 (mathematics computation) to a low of 50 (language skills, capitalization and mathematics, problem solving) and the IMM group's performance (excluding mathematics skills) ranged from a high of 69 (language skills, punctuation) to a low of 59 (language skills, spelling). The stanine scores indicate that the INT group ranked one step higher than the REG group in vocabulary and reading comprehension (INT: stanine 5, REG: stanine 4) as well as in mathematics computation (INT: stanine 6, REG stanine 5). On most of the other tests, the stanine scores of the two groups were similar. The IMM group ranked one step higher than the INT group on most of the tests. All three groups performed within the "average range" of

the national norms for grade 5,except in the case of the REG and INT groups' results on the problem solving (mathematics skills) subtest which were below average (stanine 3).

Comparison of the Three Classes in the INT Group

The results of the French Tests reveal no significant differences among the INT3, INT4 and INT5 groups on the listening comprehension test, the reading comprehension test and the oral production test, except in the rating of the pronunciation component of the latter test (for details see Table 9). Similarly there were no significant differences among the three groups on Part I (language) of the written production test. In contrast, the groups differed significantly from one another on Part II of the written production test (composition). Here the INT3 group was rated significantly lower than the INT5 group on all four measures of evaluation (content, grammar, vocabulary and spelling). The INT3 group was also rated significantly lower than the INT4 group on content and vocabulary. Between the INT4 and INT5 groups, there were no significant differences, except in grammar where the INT4 group was rated significantly lower than the INT5 group (for details see Table 9).

The analysis of the CTBS results reveals that the INT5 group scored significantly higher than the INT3 group on one of the language skills subtests (capitalization: INT5, $\bar{X} = 19.82$; INT3, $\bar{X} = 15.27$) and on two of the mathematics skills subtests (concepts: INT5, $\bar{X} = 23.39$; INT3, $\bar{X} = 17.52$; problem solving: INT5, $\bar{X} = 17.83$; INT3, $\bar{X} = 11.73$). The INT5 group also scored significantly higher than the INT4 group on

three tests: reading comprehension (INT5, $\overline{X}$ = 36.41; INT4, $\overline{X}$ = 27.50) language skills, capitalization (INT5, $\overline{X}$ = 19.82; INT4, $\overline{X}$ = 15.89) and mathematics skills, problem solving (INT5, $\overline{X}$ = 17.83; INT4, $\overline{X}$ = 13.57). Between the INT3 group and the INT4 group, there were no significant differences on any of the English language and mathematics tests (see Table 10A for mean scores and Table 10B for grade equivalent and stanine scores).

Summary and Discussion

The results of the grade 4 tests can be summarized as follows:

(1) The INT group performed significantly better than the REG group on the French language tests except on four measures of evaluation of the oral production test (comprehension, vocabulary, grammatically incorrect responses and semantically incorrect responses). On these measures, there were no significant differences among the two groups.

(2) The IMM group performed significantly better than the REG group on the French language tests except for the number of grammatically incorrect responses where there was no significant difference between the two groups.

(3) The IMM group performed significantly better than the INT group on the French language tests except on five measures of evaluation of the oral production test (comprehension, pronunciation, vocabulary, grammatically incorrect responses and semantically incorrect responses).

On these measures there were no significant differences between the two groups.

(4) There were no significant differences among the three groups on any of the English language and mathematics tests, except in the case of the spelling subtest on which the IMM group scored significantly lower than the REG group.

(5) The INT group ranked one stanine point above the REG group and one stanine point below the IMM group on most of the English language and mathematics tests.

(6) There were no significant differences between the two classes within the INT group (INT 1 and INT 2) on any of the French, English and mathematics tests, except for the comprehension component of the French oral production test where the INT 1 group was rated significantly higher than the INT 2 group.

(7) There were no significant differences between the 1982 group and the 1983 group on the French language tests, except on five measures of the oral production test (pronunciation, grammar, communication, the number of correct responses and the number of insufficient responses). On the first three measures, the 1983 group was rated significantly higher than the 1982 group. On the other hand, the 1982 group produced significantly more correct responses and fewer insufficient responses than the 1983 group.

The results of the grade 5 tests can be summarized as follows:

(1) The INT group performed significantly better than the REG group on the French language tests except on three measures of evaluation of the oral production test (pronunciation, grammatically incorrect responses and semantically incorrect responses). On these measures, there were no significant differences between the two groups.

(2) The IMM group performed significantly better than the REG group on the French language tests except on three measures of evaluation of the oral production test (pronunciation, grammatically incorrect responses and semantically incorrect responses). On these measures, there were no significant differences between the two groups.

(3) The IMM group performed significantly better than the INT group on the French language tests except on five measures of evaluation of the oral production test (comprehension, pronunciation, communication, grammatically incorrect responses and semantically incorrect responses). On these measures there were no significant differences between the two groups.

(4) There were no significant differences among the three groups on the English language and mathematics tests except in the case of three language skills subtests (capitalization, punctuation, and usage). On the capitalization subtest, the difference among the groups was marginally significant. On the punctuation subtest, the IMM group score significantly

higher than the INT group and the REG group. On the usage subtest, the IMM group scored significantly higher than the REG group and the difference between the IMM group and the INT group was not significant.

(5) The INT group scored one stanine point above the REG group on two English language subtests and on one mathematics subtest. On most of the other tests, the stanine scores of the two groups were similar. The IMM group scored, in most cases, one point above the INT group.

(6) Among the three classes of the INT group (INT3, INT4, and INT5), there were no significant differences on the following French language tests: listening comprehension, reading comprehension and oral production except for pronunciation where the INT5 group was rated significantly higher than the INT4 group.

(7) The INT5 group was rated significantly higher than the INT3 group on all four measures of evaluation of the French composition (content, grammar, vocabulary and spelling). The INT4 group was rated significantly lower than the INT5 group in grammar and significantly higher than the INT3 group in content and vocabulary. There were no significant differences among these three groups on the language subtest of the written production test.

(8) There were no significant differences among the INT3, INT4 and INT5 groups on the English language tests except in the following cases: (i) the INT5 group scored significantly higher than the INT4 group on the reading comprehension test; (ii) the INT5 group scored significantly

higher than the INT3 and INT4 groups on the computation subtest.

(9) On the mathematics skills test, the INT5 group scored significantly higher than the INT3 group on the concepts subtest. The INT5 group scored also significantly higher than both the INT3 group and the INT4 group on the problem solving subtest.

The major finding to emerge from this study is that both the grade 4 and the grade 5 students in the Intensive French program scored significantly higher on the French language tests than the grade 4 and grade 5 students in the regular French second language program. Furthermore, there were no significant differences between the INT students and the REG students on any of the English language and mathematics tests. In fact, on several tests, the INT students especially those in grade 4 were one step ahead of the REG students on the stanine scale. Thus, this study leads to the conclusion that the Intensive French program promotes higher levels of French language proficiency than the regular French second language program without having any detrimental effects on the development of mother tongue skills and academic achievement. Moreover, the finding that there were only a few significant differences between the French test results of the 1982 grade 4 students and those of the 1983 grade 4 students seems to indicate a certain consistency in the level of French proficiency reached by the students attending this program.

The comparison between the IMM students and the INT students shows

that the latter have not reached the level of French proficiency attained by immersion students at the same grade level. This finding is not suprising since the cumulative time of French instruction which the grade 4 and grade 5 immersion students have received since they entered kindergarten far exceeds that received by the students in the Intensive French program.

The absence of significant differences among the IMM students, the INT students and the REG students on the mathematics tests and on most of the English language tests is in keeping with the results noted for other types of Intensive French programs (see for instance, Barik and Swain, 1978; Edwards & al, 1981; Genesee, 1978). Even the comparatively lower performance of the IMM students on the English spelling subtest in grade 4 is not unusual for immersion students at that grade level. Lambert and Tucker (1972) noted that immersion students' spelling skills do not reach parity with those of their peers in the regular English program until grade 5 or grade 6. A more surprising finding is that the grade 5 IMM students scored significantly higher than the grade 5 REG students on the punctuation subtest, the capitalization subtest and the usage subtest. It is possible that linguistic proficiency in a second language contributes to the development of mother tongue skills (see Cummins, 1979). Such an interpretation must, however, be accepted cautiously with regard to the present study because of the small number of participating students. Further testing is needed to see whether such results will be obtained over a number of

years.

Interestingly, within the Intensive French program, there were practically no significant differences between the two grade 4 classes (INT 1 and INT 2) whereas in grade 5, one of the classes (INT5) which was part of a split-level class, scored significantly higher than the other two classes on a number of tests. Most of these results pertain to the English language and mathematics tests. These findings contrast with those from last year where the difference between the split-level grade 4 class and the other grade 4 classes in the Intensive French program had been significant on the French language tests and not on the other tests. Since the distribution of the students between the two full classes and the split-level class changed from grade 4 to grade 5, it is possible that the above noted results are merely a consequence of the particular way the students were grouped each year.

An informal comparison between the grade 4 results and the grade 5 results also reveals that while the differences between the three groups (REG, INT and IMM) were fairly consistent across the two grades on the French language tests, there were more differences among the groups on the English language tests in grade 5 than in grade 4. Moreover, in terms of stanine scores, the INT group ranked higher than the REG group in grade 4 whereas in grade 5, the differences between these two groups were not consistent. Finally, the use of stanine scores also allows us to compare the performance of the students who participated in this study to national norms. Here it was found that all three groups ranked basically

within the "average range" of the scale. There were, however, a few cases (reading comprehension,grade 4 REG group and problem solving, grade 5 REG and INT groups) where the students' performance was below average. While such comparisons must be accepted cautiously, they nevertheless provide useful guidelines for the identification of low achievement in specific areas.

In conclusion, this year's study shows that the students in the Intensive French program continue to reach a significantly higher level of French proficiency than their peers in the regular French second language program in grade 4. Moreover, even though the instructional time in French is reduced by one third the following year (grade 5), the difference in French proficiency between the students in the Intensive French program and those in the regular French second language program is maintained. In addition, the achievement in English language skills and mathematics of the students in the Intensive French program continues to be as good as and, in some cases, better than that of the students in the regular program. It will be interesting to follow the scholastic achievement of these students through grade 6.

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Table 1A

Sample Sizes for Grade 4

(1) Major Groups:

Intensive French Program (INT)	45
Immersion Program (IMM)	25
Regular French Program (REG)	26

(2) Subgroups within the Intensive French Program

INT 1	22
INT 2	23

Table 1B

Participating Schools

Herbert Purcell	Westpark	Elizabeth Ballantyne

Table 1C

Sample Sizes for Grade 5

(1) Major Groups	
Intensive French Program (INT)	51
Immersion Program (IMM)	21
Regular Program (REG)	19
(2) Subgroups within the Intensive French Program	
INT 3	18
INT 4	24
INT 5	9

Table 1D

Participating Schools

Herbert Purcell	Westpark	Elizabeth Ballantyne

Table 2

Summary of the Grade 4 French Test Results[a]

	REG	INT	IMM	F ratio	df
Listening Comprehension (56)[b]	25.48	34.02	47.86	40.82***	2,92
Reading Comprehension (32)	14.36	17.42	27.28	45.12***	2,86
Oral Production					
Global Evaluation					
- Comprehension (5)	4.14	4.45	4.88	3.55*	2,79
- Pronunciation (5)	3.35	3.85	3.97	17.57***	2,79
- Grammar (5)	2.57	3.13	3.82	14.01***	2,79
- Vocabulary (5)	2.64	3.21	3.82	10.08***	2,79
- Communication (5)	3.15	3.86	4.46	14.58***	2,79
Item Analysis (28)					
- Correct responses	9.91	13.08	19.13	30.84***	2,79
- Incorrect responses					
(i) grammatically	7.04	7.84	7.00	0.71	2,79
(ii) semantically	1.08	0.67	0.24	5.44**	2,79
(iii) insufficient resp.	9.94	6.33	1.66	19.26**	2,79

Table 2 (cont'd)

Summary of the Grade 4 French Test Results[a]

	REG	INT	IMM	F ratio	df
Oral Production (cont'd)					
Global Evaluation (Stories)					
- Grammar	1.77	2.64	3.35	14.62***	2,79
- Vocabulary	2.13	2.73	3.66	21.37***	2,79
- Communication	2.54	3.27	4.35	30.60***	2,79

* $p < .05$

** $p < .01$

*** $p < .001$

[a]Mean scores joined by a line differ significantly from one another.

[b]Maximum scores in parentheses.

Table 3A

Summary of the Grade 4 CTBS Results[a]

	REG	INT	IMM	F ratio	df
Vocabulary (36)[b]	27.67	25.65	26.67	1.45	2,94
Reading Comp. (49)	25.60	26.86	29.81	2.35	2,92
Language Skills					
- Spelling (36)	26.16	24.21	22.04	3.44*	2,94
- Capitaliz. (29)	19.56	19.39	19.46	0.01	2,92
- Punctuation (29)	17.40	15.73	18.14	1.28	2,92
- Usage (29)	18.96	17.39	19.08	0.80	2,92
Mathematics Skills					
- Concepts (32)	19.34	20.70	N.A.	0.65	1,67
- Problem Solving (25)	15.13	13.55	N.A.	1.18	1,68
- Computation (42)	30.03	30.37	N.A.	0.04	1,66

* $p < .05$

N.A.: not administered

[a]Mean scores joined by a line differ significantly from one another.

[b]Maximum scores in parentheses.

Table 3B

Grade Equivalent and Stanine Scores of the Grade 4 CTBS Results

	REG		INT		IMM	
	GE[a]	ST[b]	GE	ST	GE	ST
Vocabulary	45	4	47	5	53	6
Reading Comprehension	40	3	46	5	52	6
Language Skills						
- Spelling	45	5	47	5	46	5
- Capitalization	42	4	48	5	50	5
- Punctuation	45	4	49	5	56	6
- Usage	42	4	45	5	52	5
Mathematics Skills						
- Concepts	45	4	48	5	-	-
- Problem Solving	44	4	44	4	-	-
- Computation	48	5	53	6	-	-

[a]GE: grade equivalent

[b]ST: stanine

Table 4

Comparison of the Grade 4 French Test Results from the two Classes in the Intensive French Program

	INT1	INT2	t	df
Listening Comprehension (56)[a]	34.14	33.96	0.06	44
Reading Comprehension (32)	18.63	15.69	1.76	39
Oral Production				
Global Evaluation				
- Comprehension (5)	4.81	4.10	2.19*	37
- Pronunciation (15)	3.94	3.75	1.58	37
- Grammar (5)	3.14	3.12	0.06	37
- Vocabulary (5)	3.22	3.18	0.17	37
- Communication (5)	3.86	3.85	0.46	37
Item Analysis (28)				
- Correct responses	13.61	12.55	0.75	37
- Incorrect responses				
(i) grammatically	7.89	7.65	0.26	37
(ii) semantically	0.47	0.86	1.56	37
(iii) insufficient resp.	6.11	6.70	0.43	37

* $p < .05$

[a]Maximum scores in parentheses.

Table 5A

Comparison of the Grade 4 CTBS Results from the Two Classes in the Intensive French Program

	INT1	INT2	t	df
Vocabulary (36)[a]	26.27	24.65	0.65	41
Reading Comprehension (49)	28.65	24.50	1.36	42
Language Skills				
- Spelling (36)	25.00	23.33	0.74	41
- Capitalization (29)	18.80	19.76	0.65	40
- Punctuation (29)	15.30	16.05	0.44	40
- Usage (29)	18.45	15.90	1.21	40
Mathematics Skills				
- Concepts (32)	19.05	20.21	0.67	40
- Problem Solving (25)	13.14	14.84	0.97	40
- Computation (42)	31.14	30.68	0.20	39

[a]Maximum scores in parentheses

Table 58

Grade Equivalent and Stanine Scores of the CTBS Results for the Two Classes in the Grade 4 INT Group

	INT1		INT2	
	GE[a]	SI[b]	GE	SI
Vocabulary	48	5	46	5
Reading Comprehension	48	5	43	4
language Skills				
- Spelling	48	5	46	5
- Capitalization	47	5	49	5
- Punctuation	48	5	50	5
- Usage	48	5	43	4
Mathematics Skills				
- Concepts	47	5	49	5
- Problem Solving	43	4	46	4
- Computation	53	6	52	6

[a]GE: grade equivalent

[b]ST: stanine

Table 6

Comparison Between the 1982 and 1983 Grade 4 Classes in the Intensive French Program

	1982	1983[b]	t	df
Listening Comprehension (56)[a]	34.87	34.04	0.65	104
Reading Comprehension (32)	19.71	17.37	2.14	99
Oral Production				
Global Evaluation				
- Comprehension (5)	4.30	4.45	0.61	70
- Pronunciation (5)	3.08	3.85	7.00***	70
- Grammar (5)	2.79	3.13	2.07*	70
- Vocabulary (5)	2.95	3.21	1.18	70
- Communication (5)	3.11	3.86	4.14***	70
Item Analysis (28)				
- Correct responses	15.55	13.08	2.49*	70
- Incorrect responses				
(i) grammatically	7.70	7.85	0.23	70
(ii) semantically	0.67	1.32	1.12	70
(iii) insufficient resp.	4.04	6.28	2.54*	70

Table 6 (cont'd)

Comparison Between the 1982 and 1983 Grade 4

Classes in the Intensive French Program

	1982	1983[b]	t	df
Oral Production (Stories)				
Global Evaluation				
- Grammar (5)	2.58	2.64	0.30	70
- Vocabulary (5)	2.67	2.73	0.29	70
- Communication (5)	2.83	3.27	2.27*	70

* $p < .05$

** $p < .01$

*** $p < .001$

[a]Maximum scores in parentheses.

[b]Means shown for the 1983 group differ from those on Table 2 because the latter were adjusted for group differences on the Lorge Thorndike test scores.

Table 7

Summary of Grade 5 French Test Results[a]

	REG	INT	IMM	F ratio	df
Listening Comprehension (56)[b]	32.76	41.58	48.05	16.38***	2,87
Reading Comprehension (32)	13.63	17.95	30.17	54.54***	2,89
Oral Production					
Global Evaluation					
- Comprehension (5)	4.33	4.70	4.76	3.42*	2,73
- Pronunciation (5)	3.32	3.50	3.64	2.38	2,73
- Grammar (5)	1.88	2.62	3.23	19.97***	2,73
- Vocabulary (5)	1.90	2.80	3.41	16.45***	2,73
- Communication (5)	2.28	2.92	3.30	7.84***	2,73
Item Analysis					
- Correct responses (29)	4.69	9.49	15.37	17.27***	2,73
- Incorrect responses					
(i) grammatically	6.95	8.75	9.51	2.92	2,73
(ii) semantically	1.00	2.23	2.04	1.66	2,73
(iii) insufficient resp.	16.65	10.11	5.10	18.01***	2,73

Table 7 (cont'd)

Summary of Grade 5 French Test Results

	REG	INT	IMM	F ratio	df
Written Production					
- Language (37)	5.44	9.23	25.00	75.86***	2.79
- Composition					
(i) content (5)	1.60	2.31	3.30	22.11***	2,79
(ii) grammar (5)	1.41	2.21	3.26	37.46***	2,79
(iii) vocabulary (5)	1.30	2.12	3.19	38.29***	2,79
(iv) spelling (5)	1.17	2.05	3.32	67.25***	2,79

* $p < .05$

** $p < .01$

*** $p < .001$

[a]Mean scores joined by a line differ significantly from one another.

[b]Maximum scores in parentheses.

Table 8A

Summary of the Grade 5 CTBS Results[a]

	REG	INT	IMM	F ratio	df
Vocabulary (39)[b]	26.60	28.87	29.24	1.79	2,90
Reading (54)	30.25	31.03	34.02	2.17	2,84
Language Skills					
- Spelling (40)	27.52	27.42	27.71	0.01	2,83
- Capitalization (30)	18.66	16.43	19.26	4.14*	2,83
- Punctuation (30)	17.06	15.23	20.05	9.71***	2,83
- Usage (30)	17.94	18.11	21.72	5.79**	2,83
Mathematics Skills					
- Concepts (37)	21.03	20.27	N.A.	0.24	1,63
- Problem Solving (27)	13.61	13.50	N.A.	0.01	1,63
- Computation (45)	29.66	30.11	N.A.	0.05	1,63

* $p < .05$

** $p < .01$

*** $p < .001$

N.A.: not administered

[a]Mean scores joined by a line differ significantly from one another.

[b]Maximum scores in parentheses.

Table 8B

Grade Equivalent and Stanine Scores of the Grade 5 CTBS Results

	REG		INT		IMM	
	GE[a]	ST[b]	GE	ST	GE	ST
Vocabulary	55	4	60	5	62	6
Reading Compr.	54	4	56	5	62	6
Language Skills						
- Spelling	55	5	57	5	59	5
- Capitalization	55	5	50	4	60	5
- Punctuation	60	5	55	5	69	6
- Usage	50	4	53	4	63	6
Mathematics Skills						
- Concepts	56	5	56	5	-	-
- Problem Solving	49	3	50	3	-	-
- Computation	59	5	61	6	-	-

[a]GE: grade equivalent

[b]ST: stanine

Table 9

Comparison of the Grade 5 French Test Results from the Three Classes in the Intensive French Program[a]

	INT3	INT4	INT5	F ratio	df
Listening Comprehension (56)[b]	39.99	40.67	45.67	1.29	2,47
Reading Comprehension (32)	17.04	17.12	21.03	1.28	2,47
Oral Production					
Global Evaluation					
- Comprehension (5)	4.56	4.76	4.81	1.04	2,42
- Pronunciation (5)	3.59	3.32	3.86	3.96*	2,42
- Grammar (5)	2.69	2.53	2.67	0.34	2,42
- Vocabulary (5)	2.67	2.96	2.57	0.76	2,42
- Communication (5)	2.59	3.04	3.28	3.07	2,42
Item Analysis (28)					
- Correct responses	8.51	8.35	7.53	0.08	2,42
- Incorrect responses					
(i) grammatically	7.90	9.67	7.15	1.81	2,42
(ii) semantically	1.41	1.52	1.31	0.05	2,42
(iii) insufficient resp.	11.29	9.37	12.99	0.88	2,42

Table 9 (cont'd)

Comparison of the Grade 5 French Test Results from the Three Classes in the Intensive French Program

	INT3	INT4	INT5	F ratio	df
Written Production					
- Language (37)	8.39	8.00	13.36	2.75	2,42
- Composition					
(i) content (5)	1.83	2.51	2.58	5.66**	2,42
(ii) grammar (5)	1.90	2.16	2.82	5.38**	2,42
(iii) vocabulary (5)	1.73	2.23	2.50	4.71*	2,42
(iv) spelling (5)	1.70	2.11	2.47	5.55**	2,42

* $p < .05$

** $p < .01$

[a]Mean scores joined by a line differ significantly from one another.

[b]Maximum scores in parentheses.

Table 10A

Comparison of the Grade 5 CTBS Results from the Three Grade 5 Classes in the Intensive French Program[a]

	INT3	INT4	INT5	F ratio	df
Vocabulary (39)[b]	27.53	28.66	30.23	0.63	2,46
Reading Comprehension (54)	31.81	27.50	36.41	4.67*	2,43
Language Skills					
- Spelling (40)	25.11	29.76	26.22	3.18	2,44
- Capitalization (30)	15.27	15.89	19.82	3.48*	2,44
- Punctuation (30)	14.89	14.91	16.44	0.29	2,44
- Usage (30)	18.41	16.76	20.41	2.01	2,44
Mathematics Skills					
- Concepts (37)	17.52	21.59	23.39	5.38**	2,45
- Problem Solving (27)	11.73	13.57	17.83	9.78***	2,45
- Computation (45)	27.26	31.86	32.24	3.21*	2,44

* $p < .05$

** $p < .01$

*** $p < .001$

[a]Mean scores joined by a line differ significantly from one another.

[b]Maximum scores in parentheses.

Table 108

Grade Equivalent and Stanine Scores of the CTBS Results for the Three Classes in the Grade 5 INT Group

	INT3		INT4		INT5	
	GE[a]	ST[b]	GE	ST	GE	ST
Vocabulary	56	5	58	5	74	8
Reading Compr.	50	4	58	5	69	7
Language Skills						
- Spelling	56	5	52	4	70	6
- Capitalization	46	3	47	3	66	6
- Punctuation	52	4	52	4	65	6
- Usage	46	3	55	5	66	6
Mathematics Skills						
- Concepts	55	4	52	4	69	7
- Problem Solving	48	3	47	3	65	6
- Computation	60	5	56	5	72	8

[a]GE: grade equivalent

[b]ST: stanine

Appendix I

Explanation of Analysis of Covariance

Analysis of covariance is a statistical procedure which is similar to the analysis of variance in that it is used to compare the results of two or more groups on a particular test. At the same time, analysis of covariance mathematically reduces the influence that another variable, such as I.Q., might have on the test results. For example, if two hypothetical language groups under investigation differ a priori in terms of I.Q., and if it is believed that I.Q., will significantly influence performance on the test being administered (e.g., a reading test), then an analysis of covariance will estimate the significance of the language factor. This mathematical procedure is used when it is difficult or impossible to select groups which are equivalent in I.Q..

Appendix II

Explanation of Grade Equivalents

The grade equivalent of a given raw score on any test indicates the grade level at which the typical pupil makes this raw score. In scores between 31 and 81, the first digit represents the grade and the second digit the month within the grade in which the typical pupil makes the corresponding raw score. Strictly speaking, the second digit represents tenths of a year's difference between grade medians for successive years. For example, if a pupil makes a grade equivalent of 57, this means that the raw score on the test is the same as that made by the typical or median pupil in grade five at the end of the seventh month.

The grade equivalent of an entire group is a mean based on the individual grade equivalents of all the students in that group.